THE MENTAL WELLNESS SOCIETY©
INTERNATIONAL

The Gut Brain Connection:

How Red Light Supports Mood, Cognition and Nervous System Health:

Light, resilience and biological regulation in a VUCAH world

SARAH TURNER (CEO & Co-Founder CeraThrive)

www. cerathrive.com

Sarah Turner

Brain-Gut PBM Expert

- Degrees in Psychological Sciences, Nutritional Medicine & Clinical Neuroscience, Diploma PBM - coordinator PBM and Neurology
- Clinical trial involvement in near-infrared light therapy for Parkinson's Disease
- Focus on practical neuroscience and nervous system regulation

Why Mental Wellness Matters to Me:

- Shared mission: empowering people to take charge of their health and wellness
- Passionate about bridging science, technology, and holistic practices
- Holistic Approach of mind and brain modalities together

VUCAH
Is Biological

VUCAH environments increase:

- Hypervigilance
- Cognitive overload
- Sleep disruption
- Burnout
- Nervous system dysregulation
- Allopathic load

Mental Wellness is not just psychological.
It is physiological MIND- BODY- BRAIN AXIS

Humans Evolved Within

Rhythmic Environmental Signals

Past

Present

Light Is Biological Information

The Science of

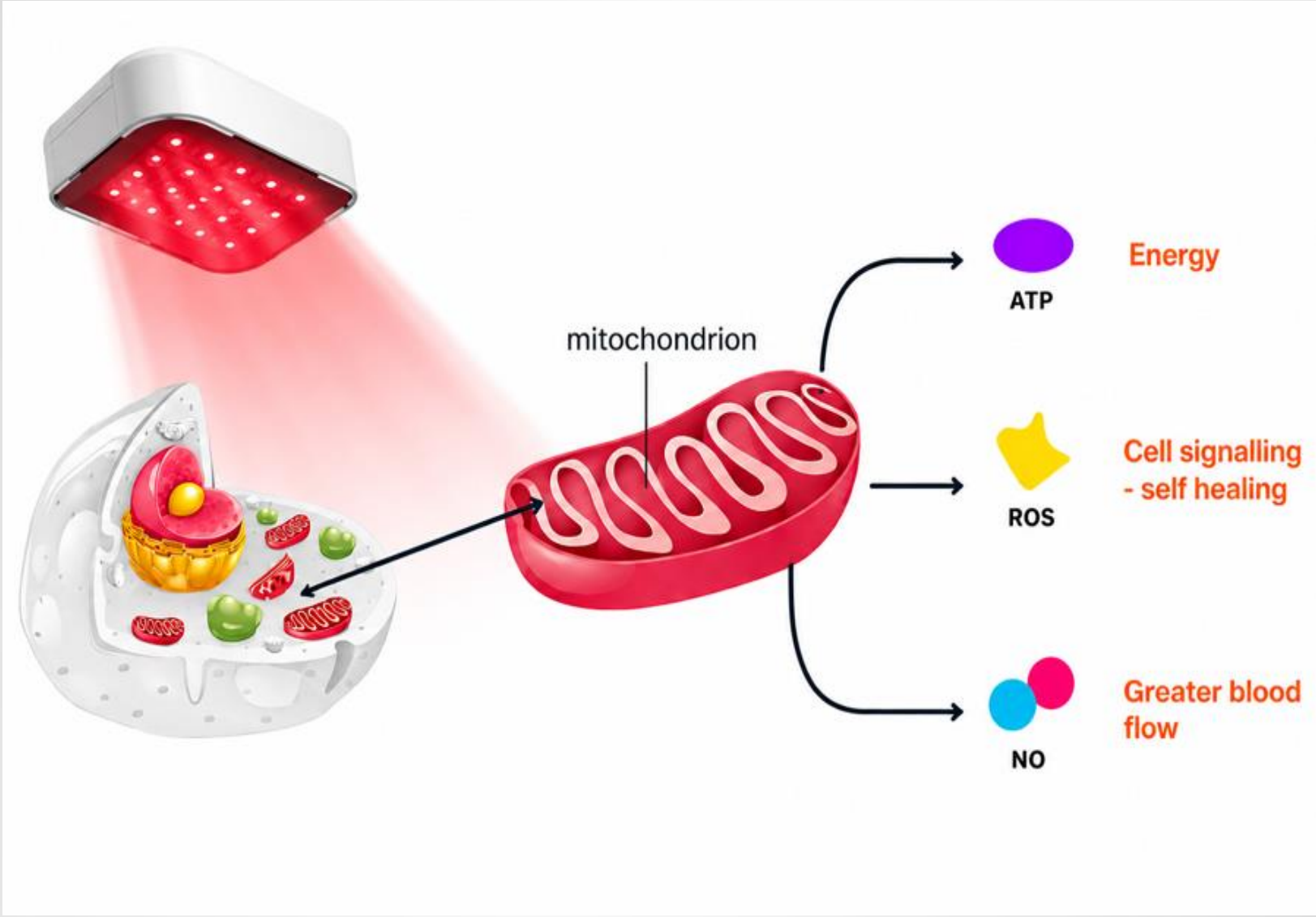
Red And Near Infrared Light

Photobiomodulation primarily works through metabolic and cellular signalling pathways.

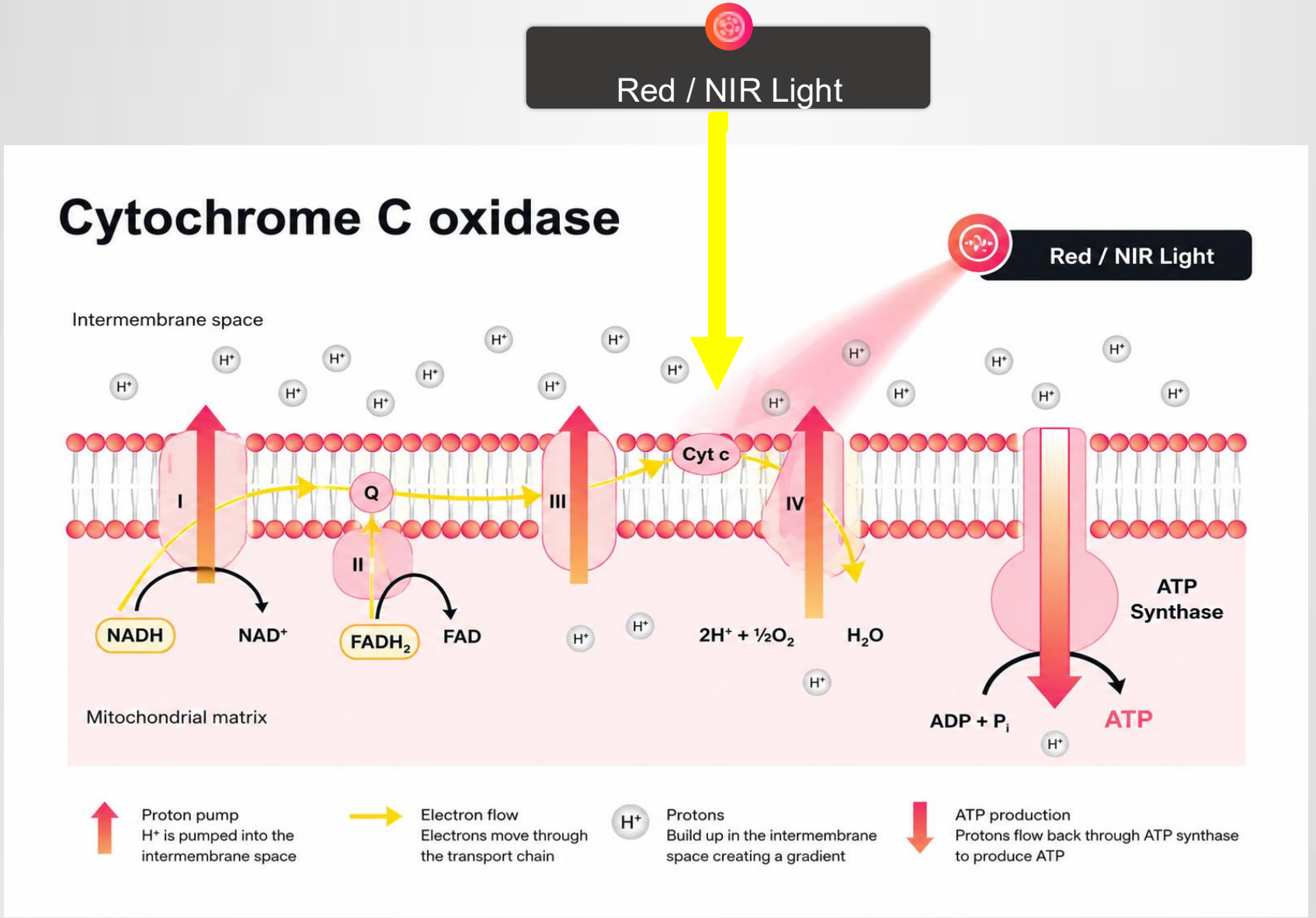
1. Supports mitochondrial energy production
2. Supports physiology
3. Modulates inflammation
4. Improves circulation
5. Influences nitric oxide signalling

Mitochondria

The Light Sensor In The Cell

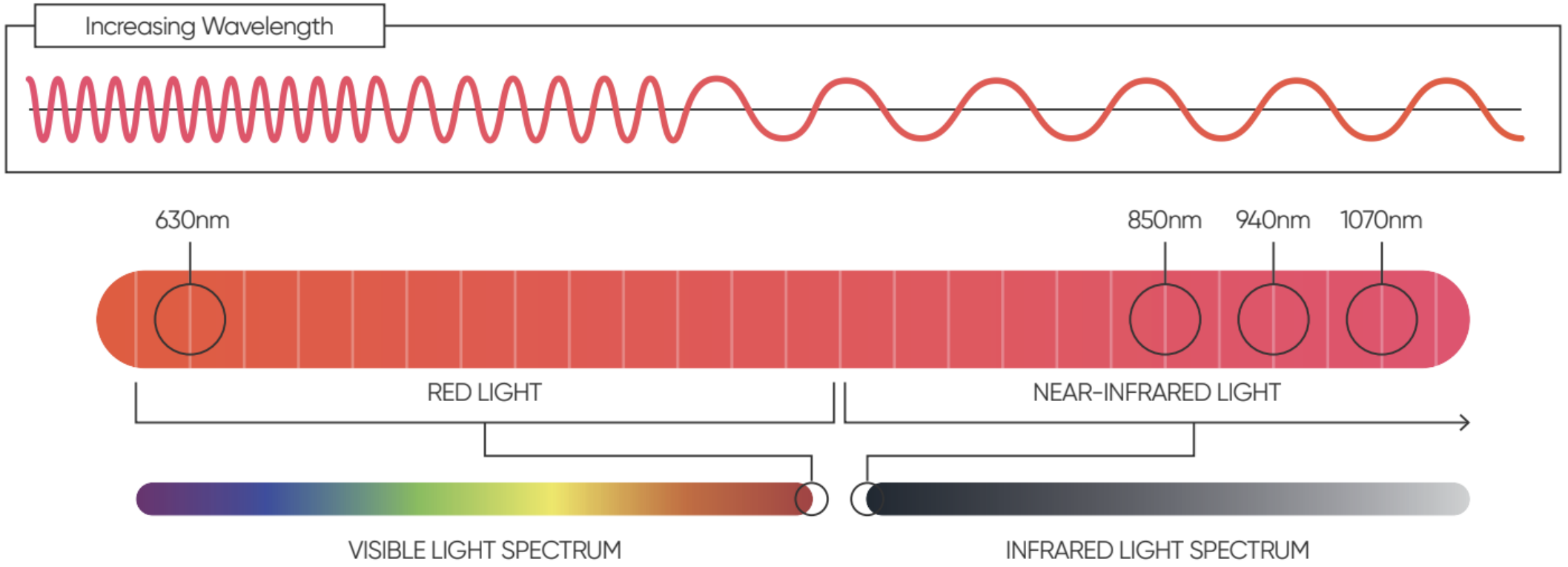


Cytochrome C oxidase



PBM

Photobiomodulation or ‘Red Light’ Therapy



CERA Pulsed PBM Is Different From Traditional Brainwave Entrainment

Brainwave Entrainment	Pulsed Photobiomodulation CERA System
Attempts to synchronise EEG activity to external rhythmic stimuli	Uses rhythmic light delivery to mimic natural biological light variation
Typically uses flashing light or rhythmic sound stimulation	Uses gentle red and near infrared therapeutic light
Focuses on influencing brainwave frequency states	Focuses on mitochondrial, vascular and cellular signalling
Often compares brain activity against databases of “normal” EEG patterns	Provides biologically familiar rhythmic signals rather than EEG correction
Often aims to normalise or shift mental states through EEG modulation	Pulsing is biomimetic, reflecting dynamic patterns found in nature

CERA

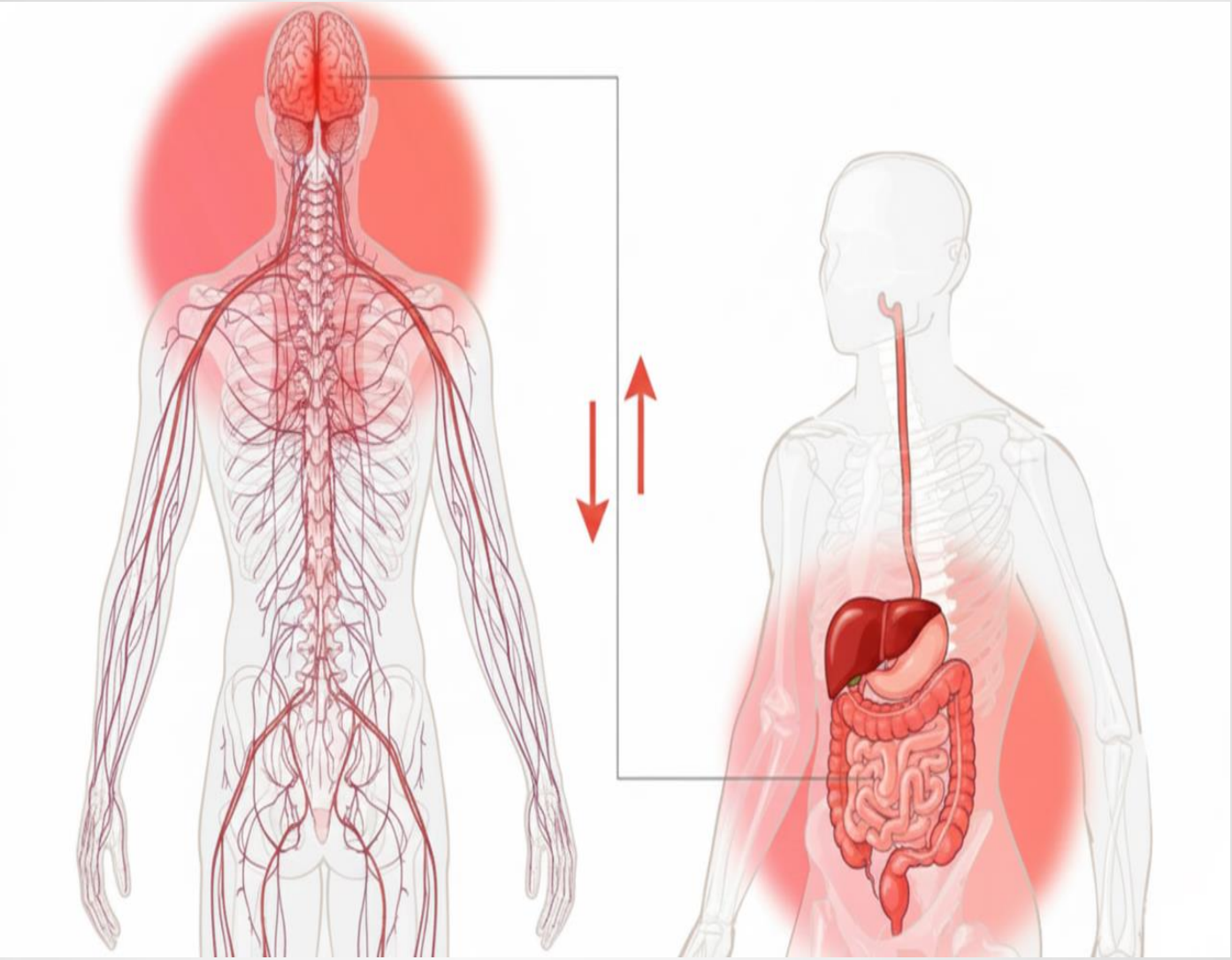
Pulse Light Frequencies

Frequency	Brain Wave	Brain State	Program
7.83 Hz Schumann Frequency (Theta)		Grounded, Calm, Chill	Balance
10 Hz (Alpha)		Creative, Focused, Flow	Focus
40 Hz (Gamma)		Cognition, Flexibility, Performance	Perform
100 Hz (High Gamma)		Meditation, Expanded Consciousness	Meditate
Continuous		Maximum Energy	Energy
Wave		Full Power Healing	Resilience

Why The Gut Matters

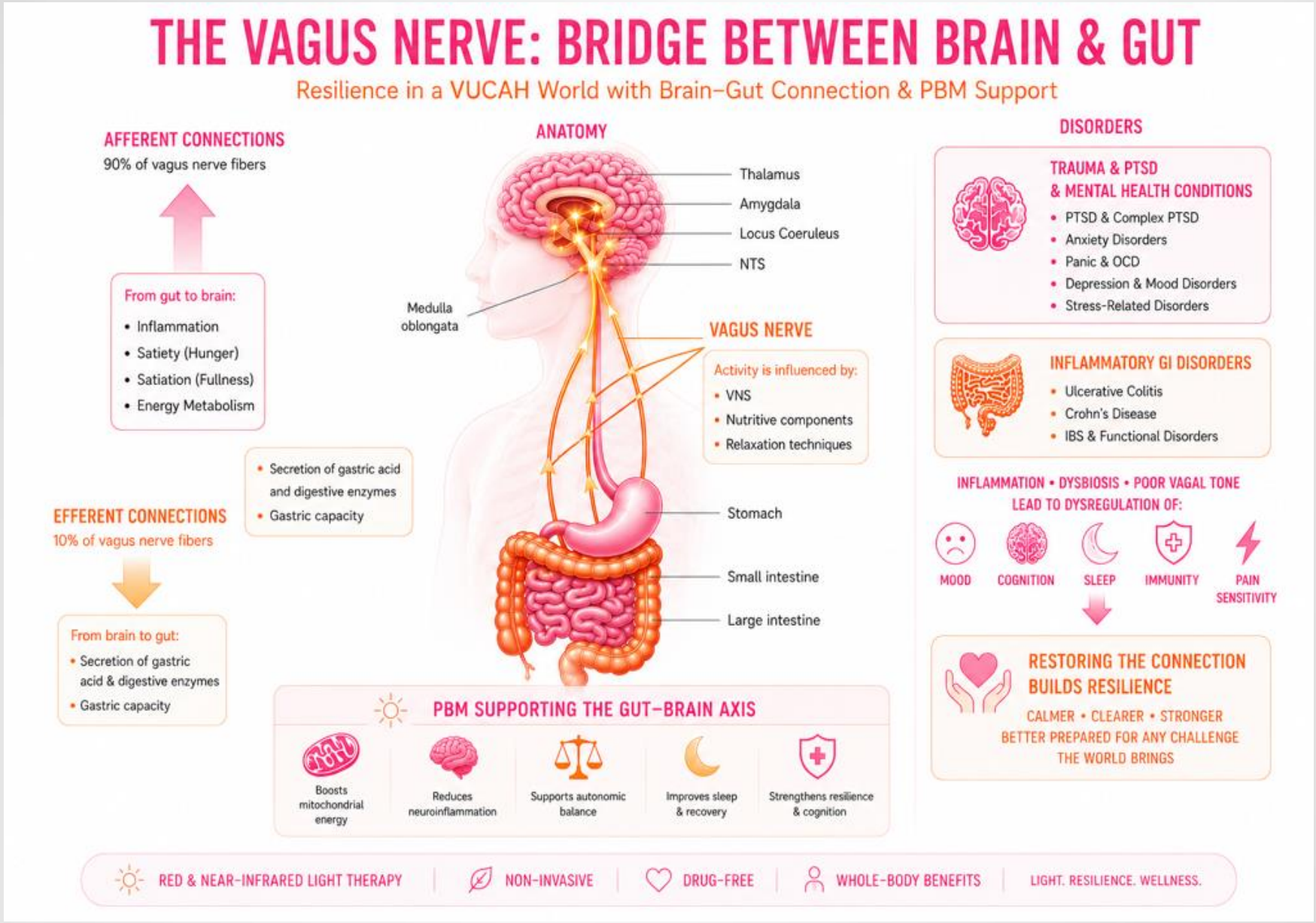
The gut is a major regulator of mood, cognition and nervous system function:

- Vagus nerve
- Gut microbiota
- Neuroendocrine system
- Neuroimmune systems
- Hypothalamic–pituitary–adrenal (HPA) axis
- Endocannabinoid system
- Stem cells
- Enteric nervous system

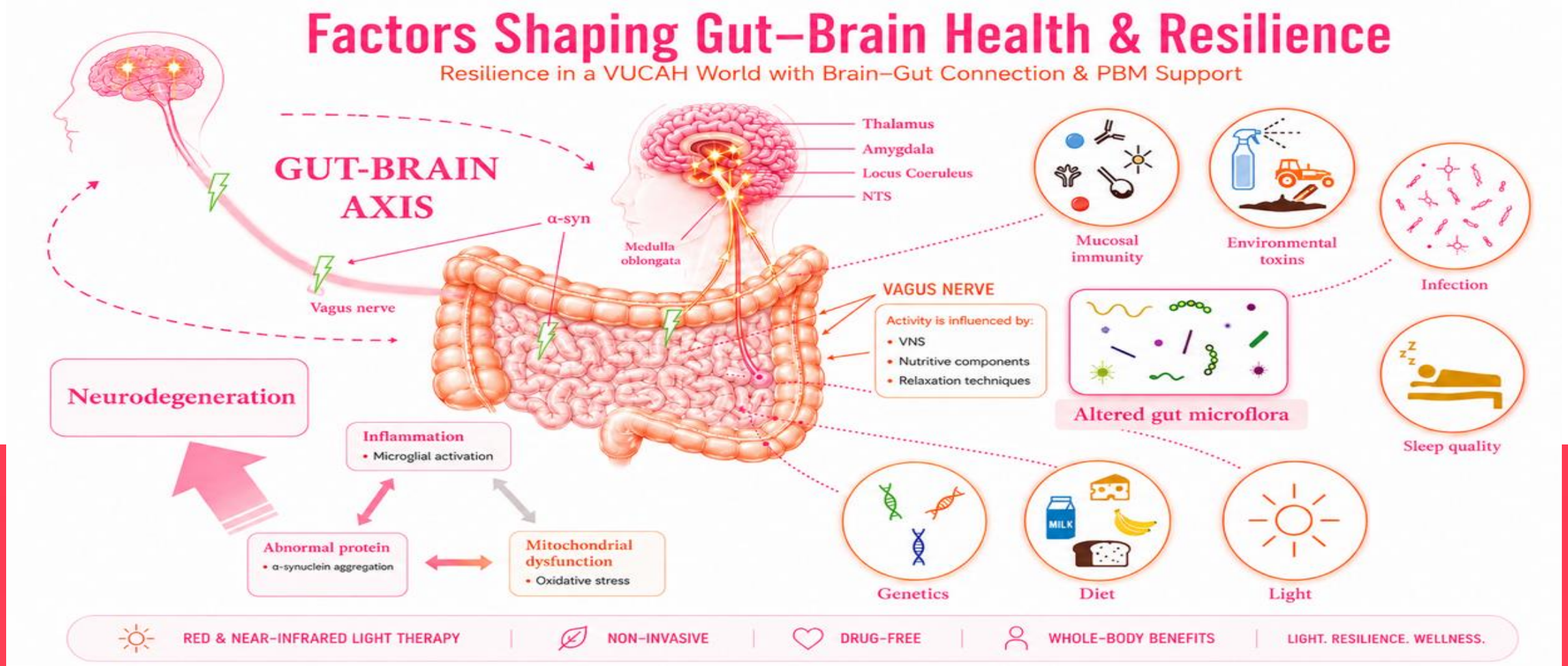


Vagus Nerve:

Bridge Between Brain And Gut



Factors Shaping Gut-Brain Health And Resilience



Chao Yin-Xia, Gulam Muhammad Yaaseen, Chia Nicholas Shyh Jenn, Feng Lei, Rotzschke Olaf, Tan Eng-King - Wikipedioa

VUCAH and Nervous System Dysregulation

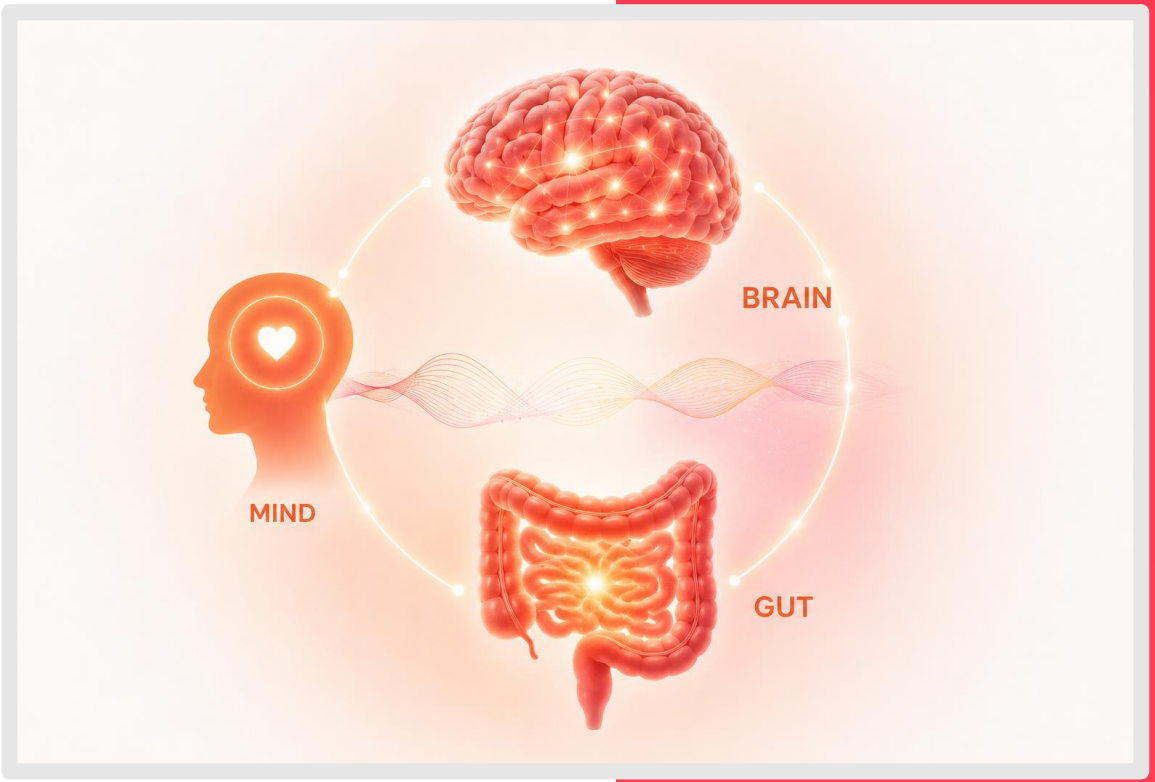
VUCAH Stressor	Nervous System Impact	Potential PBM Support
Volatility	Anxiety, hypervigilance, muscle tension	Supporting autonomic regulation and reducing inflammatory stress signalling
Uncertainty	Stress, fear, sleep disruption	Supporting circadian biology, sleep recovery and mitochondrial function
Complexity	Cognitive overload and burnout	Supporting ATP production, neurovascular function and cognitive energy metabolism
Ambiguity	Cortisol dysregulation and fatigue	Supporting recovery physiology and reducing chronic inflammatory load
Hyper-connectivity	Information overload and sympathetic activation	Supporting autonomic recovery through improved cellular energy metabolism

PBM, Resilience and the Mind-Body-Brain Axis

PBM supports:

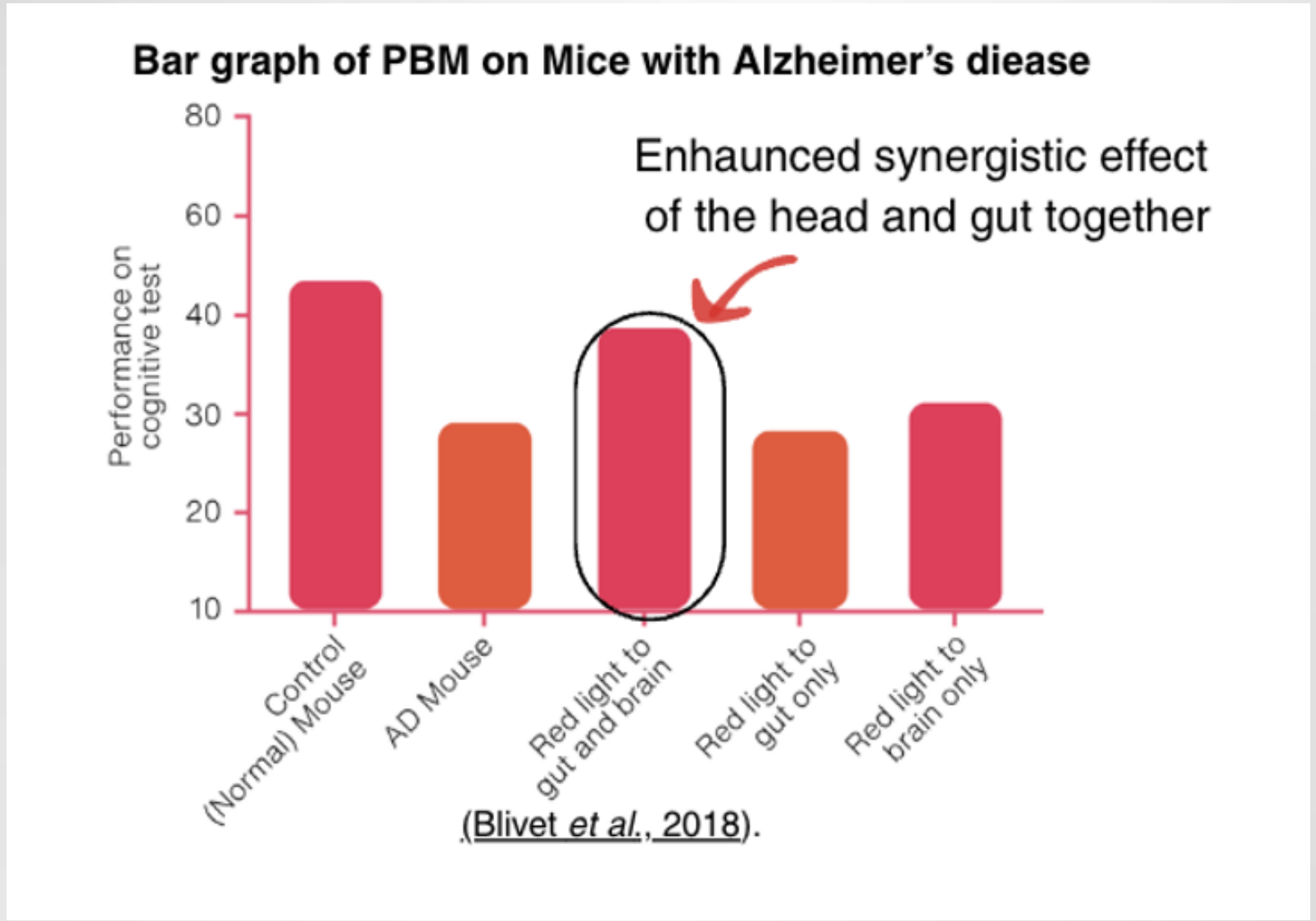
- Recovery physiology
- Autonomic regulation
- Mitochondrial resilience
- Sleep and recovery
- Cognitive energy and adaptability

Resilience is biological adaptability.



Emerging Evidence

- Strong evidence from animal studies
- Clinical trials now underway
- The gut and brain are intrinsically linked
- Efficacy improves if both organs are stimulated



Case Study

ALS reversal supported by statistically significant QEEG, SpO_2, neurofilament biomarkers, and clinical outcome improvements.

Published under supervision of Prof Paul Chazot

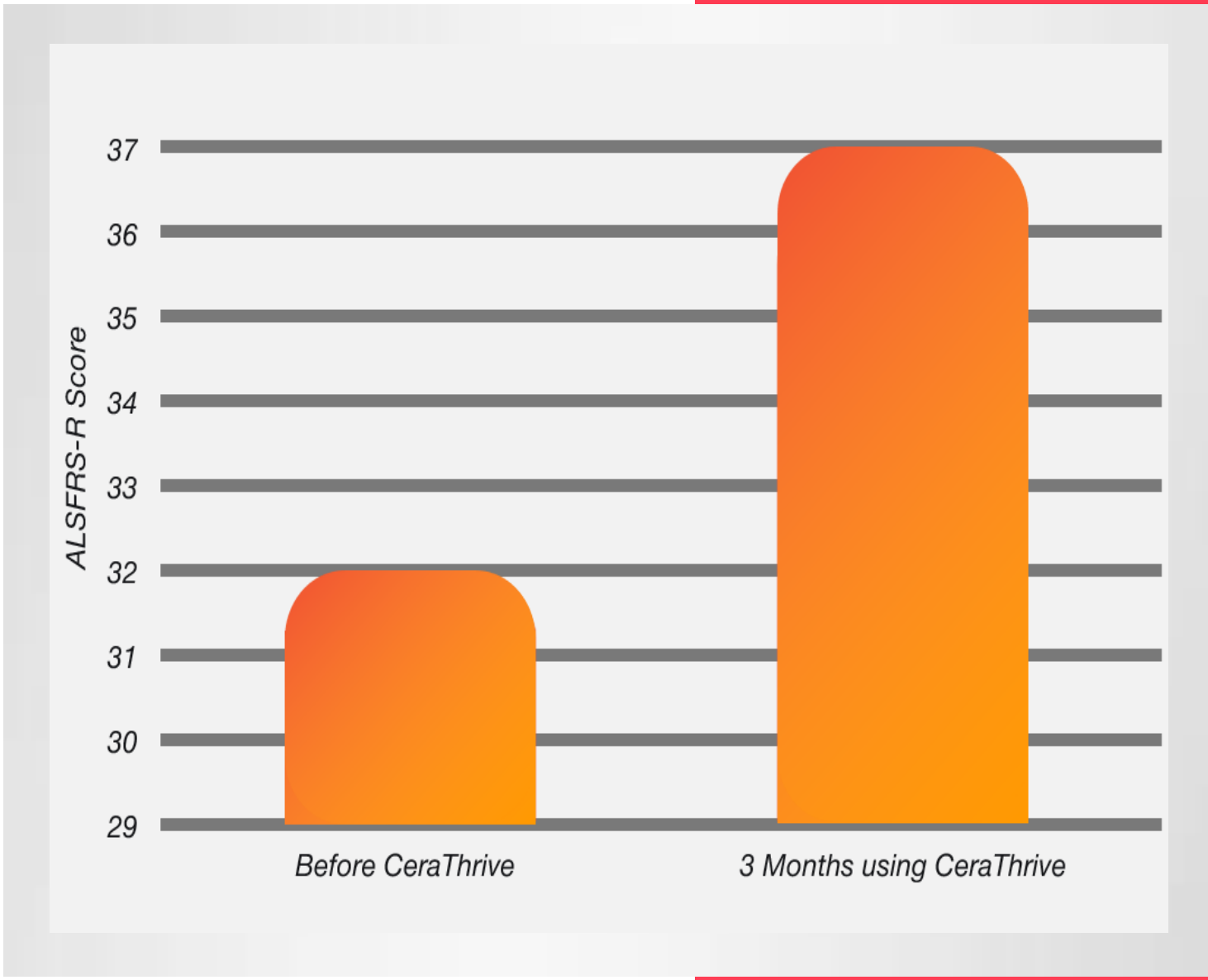
Durham University

BBC

ALSFRS-R Score

Before and After Using CeraThrive

Functional improvement observed over 3 months of regular CeraThrive use. ALSFRS-R score increased from 32 to 37. The ALSFRS-R is the standard clinical measure of functional status in motor neurone disease, with typical progression showing a decline of 1-2 points per month. The observed 5-point improvement warrants further investigation in controlled studies. n=1.



The CERA System consumer / clinic

CERA BRAIN
4 unique wavelengths

Cerebellum Light Pod

Comfortable Strap

Frontal Cortex Light Pod (3x) & Controls

CERA BODY
2 unique wavelengths

41 powerful LEDs build in

On/Off & build-in battery (low emf)

Hygienic Soft Silicone Material

The CERA PRO +

A programmable nervous system wellness platform

Combining:

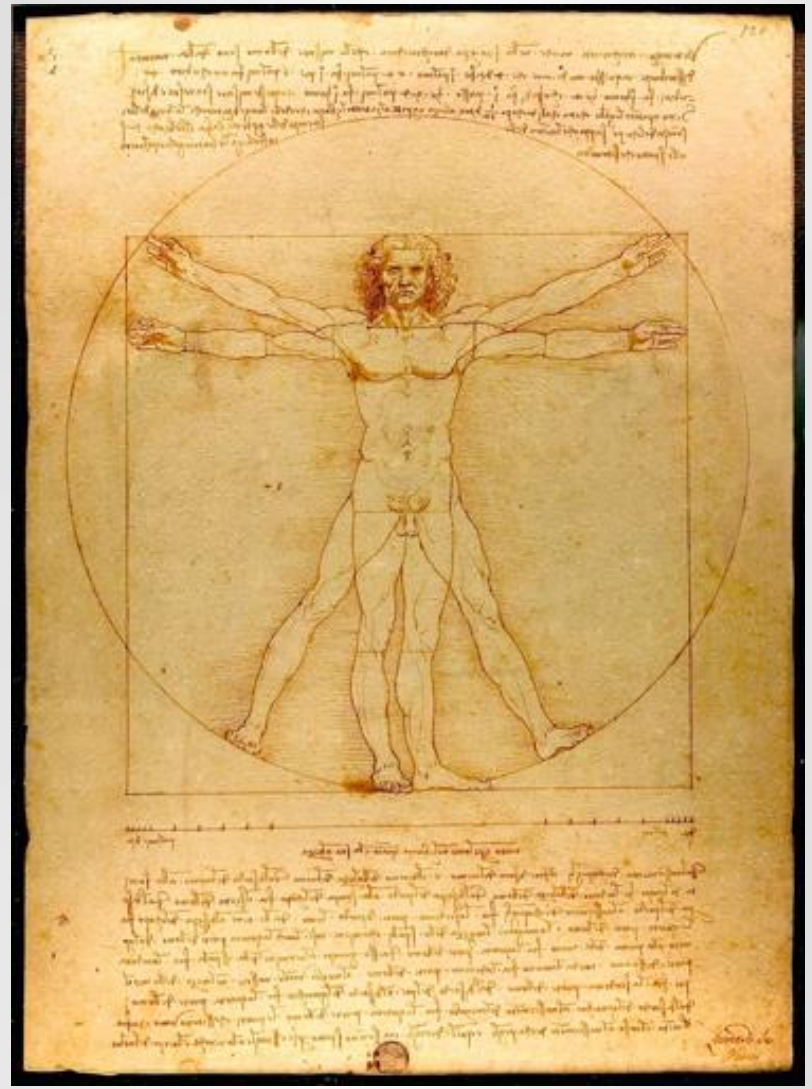
- Photobiomodulation
- behavioural wellness
- nervous system regulation
- recovery protocols
- cognitive optimisation
- mental wellness support

Holistic approach to MIND –BODY – BRAIN AXIS

- Our bodies are **interconnected system**
- The brain is not isolated from the body
- Mood and cognition are linked to metabolism and physiology
- Environmental signals shape biological regulation
- Resilience requires recovery capacity

Mental wellness is deeply biological. We need to **develop technology that will take into account our complex systems and maximise the therapeutic effect?**

We must think holistically.



THANK-YOU

Questions?

Special offer to ResWell community 20%
Code : ResWell20

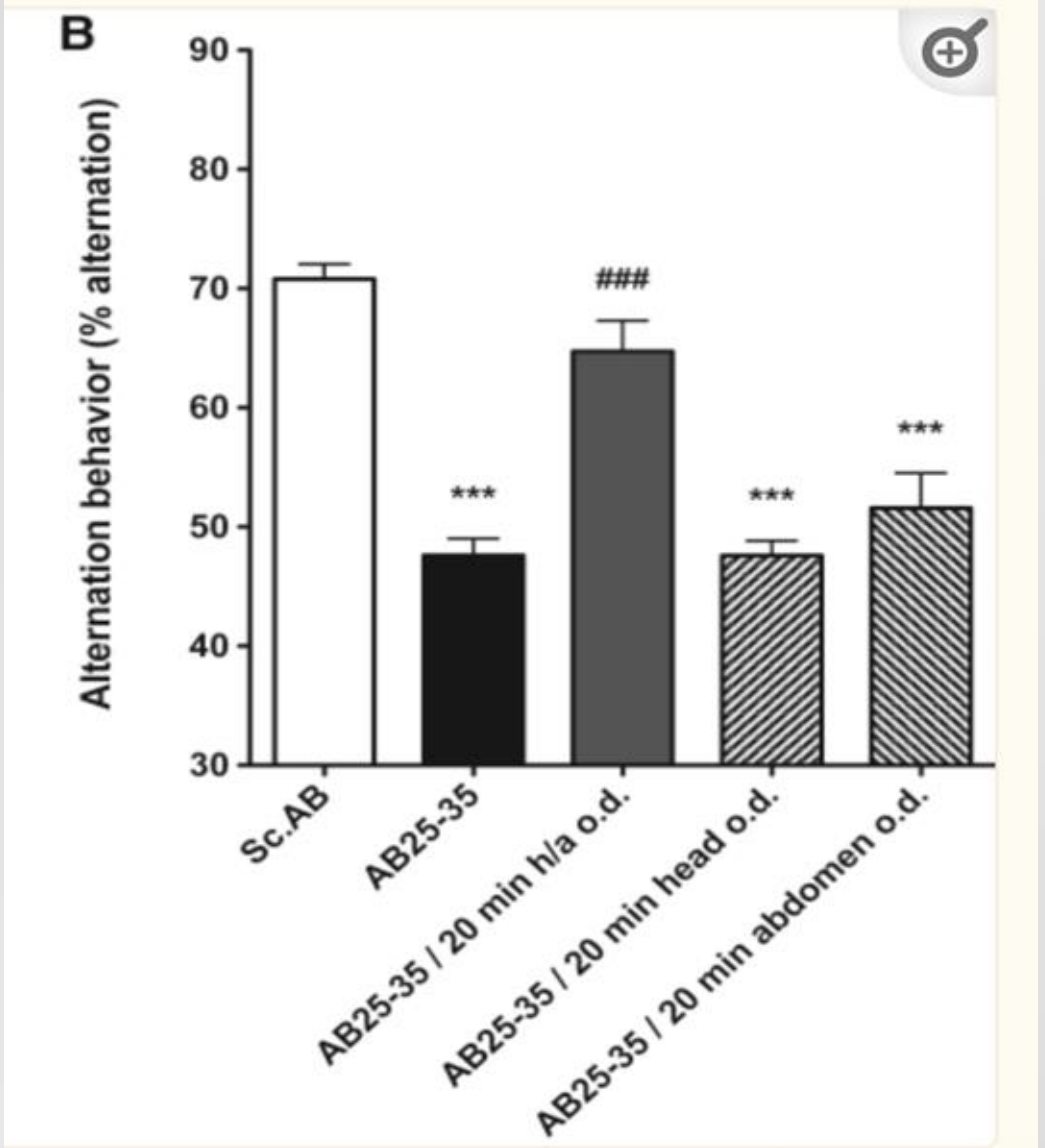
www. cerathrive.com
Contact : sarah@cerathrive.com

Animal Studies:

Alzheimer's Disease

Guillaume Blivet, Johann Meunier,Francois J. Roman, and Jacques Touchon. Improvements in clinical signs of Neuroprotective effect of a new photobiomodulation technique against Aβ**25–35** peptide–induced toxicity in mice: Novel hypothesis for therapeutic approach of Alzheimer's disease suggested 2018

- Mouse model AD
- RGn500 (LASER 850 nm, LED 850 nm, 625 nm) was applied once a day for 7 days either on the top of the head or the center of abdomen or both.
- Neuroprotective effect in the Aβ25–35 mouse model when the light beam, with described parameters, was applied both to the head and abdomen but not when only to the head or abdomen



Human Studies:

Abdomen and Brain (Alzheimer's Disease)

Pilot Study Evaluating the Safety and Efficacy of a Photobiomodulation Prototype, REGEnLIFE RGn530 Device, on Cognitive Performances Evolution From Mild-to-moderate Alzheimer's Disease Patients: Guillaume Blivet

Double-blind, randomized, monocenter, placebo-controlled clinical trial

- Near-infrared and red **LEDs**
- Adult volunteers aged 55 to 85, with mild to moderate Alzheimer’s disease.
- Helmet and a photobiomodulation abdominal belt
- 40 x 25 minutes over a two-month period,
- Evaluated ADAS-Cog score, (Alzheimer’s Disease Assessment Scale) during the trial and 1 month after.

Out of 64 planned patients, 43 patients assessed until end of the trial. No major side effects. While the primary efficacy endpoint was not statistically met, there was a clear improvement trend in a set of cognitive functions.

Human Studies:

Abdomen, Head And Neck (Parkinson's Disease)

Ann Liebert, Brian Bicknell, E-Liisa Laakso, Parastoo Jalilitabaei, Sharon Tilley, Hosen Kiat, and John Mitrofanis. Remote Photobiomodulation Treatment for the Clinical Signs of Parkinson's Disease: A Case Series Conducted During COVID-19. 16 Feb 2022

- LASER light source.
- 7 participants were treated with PBM to the abdomen and neck 3 x week for 12 weeks.
- Assessed for mobility, balance, cognition, fine motor skill, and sense of smell on enrolment, after 12 weeks of treatment in a clinic and after 33 weeks of home treatment.

Results:

- Clinical signs of PD were shown to be improved by remote PBM treatment, including mobility, cognition, dynamic balance, spiral test, and sense of smell.
- Improvements maintained for 45 weeks
- Improvements were individual to the participant. Some improvements were lost for certain participants during at-home treatment, which coincided with a number of enforced coronavirus disease 2019 (COVID-19) pandemic lockdown periods.

Human Studies:

Microbiome retrospective (Parkinson's Disease)

Bicknell B, Liebert A, McLachlan CS, Kiat H. Microbiome Changes in Humans with Parkinson's Disease after Photobiomodulation Therapy: A Retrospective Study. *Journal of Personalized Medicine*. 2022; 12(1):49. https://doi.org/10.3390/jpm12010049

- LASER Light source.
- Retrospectively analysis of the microbiome from human stool samples from the previously study (Liebert et al 2021).
- Observed changes in the microbiome of Parkinson's patients after a 12-week treatment regimen with photobiomodulation to the abdomen, neck, head and nose.
- **Positive changes in the Firmicutes to Bacteroidetes (F:B) ratio**, which is often interpreted as a proxy for gut health.

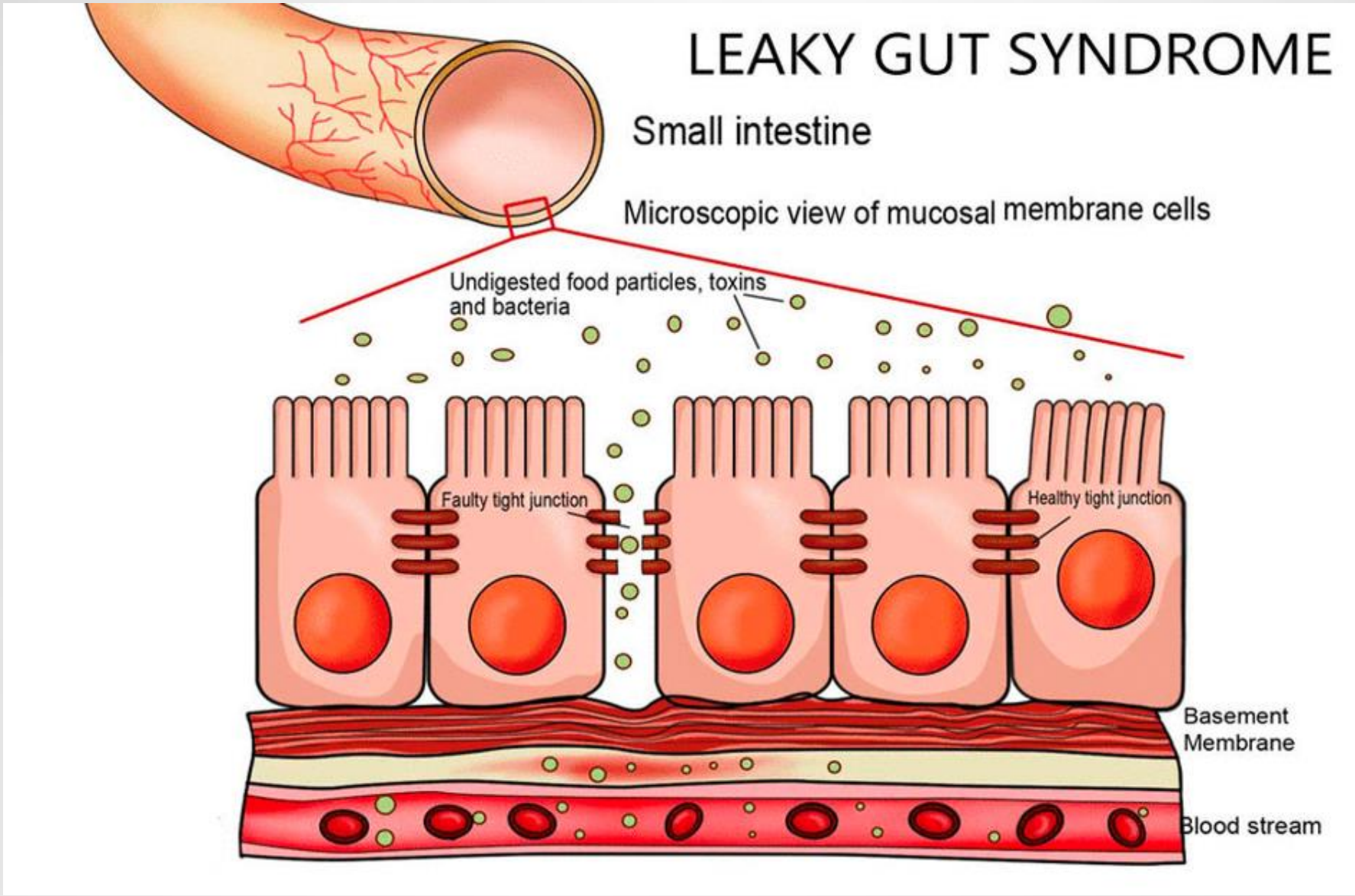
Human Studies:

Microbiome (Case Study-Cancer patient)

Brian Bicknell, E-Liisa Laakso, Ann Liebert, and Hosen Kiat Modifying the Microbiome as a Potential Mechanism of Photobiomodulation: A Case Report *Photobiomodulation, Photomedicine, and Laser Surgery 2022 40:2, 88-97*

- The participant had their microbiome tested on 9 occasions, 3 x before treatment, 3 x after radiotherapy and immunotherapy for breast cancer, and 3 x after PBM treatment.
- PBM treatment infrared LASER treatment (904 nm; 700 Hz pulse frequency, 861.3 total joules) to the abdomen 3 x week for 11 weeks.

Results:

- The microbiome of the participant showed significant changes in diversity after PBM treatment
- Increase in the number of known beneficial bacteria (Akkermansia, Faecalibacterium, and Roseburia)
- Decrease in the number of potentially pathogenic genera.

Leaky Gut Syndrome